

Application No. 09/896,703
Reply to Office Action of August 23, 2005
Amendment dated December 2, 2005

Docket No. CM03093J

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended): A digital receiver fast frequency and time acquisition system comprising:

a first channel select (CS) filter filtering an incoming digital baseband signal;
a frame synchronization detector for recognizing a single time synchronization word from the first filtered signal;

a coarse symbol time estimator for coarsely determining the symbol time synchronization of the digital signal using the single time synchronization word after ~~from the~~ frame synchronization detector ~~detection~~;

a one-step fine frequency estimator for finely determining the frequency error of the signal using the single time synchronization word after ~~from the~~ coarse symbol time estimator ~~estimation~~ for providing a frequency adjustment signal;

a mixer for combining the incoming digital baseband signal with the frequency adjustment signal and providing a frequency corrected digital signal;

a second CS filter for filtering the frequency corrected digital signal;

a fine symbol time estimator for determining symbol timing with greater precision of the filtered signal from the second CS filter using the single time synchronization word; and

a symbol detector for interpreting the digital signal ~~from~~ after the fine symbol time estimator ~~estimation~~; and

wherein the system operates without the use of an automatic frequency control.

2. (Original): A digital receiver fast frequency and time acquisition system as in claim 1, wherein the first CS filter has a wider bandwidth than the second CS filter.

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3. (Previously presented): A digital receiver fast frequency and time acquisition system as in claim 1, wherein the second CS filter has exactly half (or any other simple fractions such as one third, or one fourth etc) the bandwidth of the first CS filter.

4. (Original): A digital receiver fast frequency and time acquisition system as in claim 1, wherein the first CS filter has a 3 decibel (dB) bandwidth of approximately 6 KiloHertz (KHz).

5. (Original): A digital receiver fast frequency and time acquisition system as in claim 4, wherein the second CS filter has a 3 decibel (dB) bandwidth of approximately 3 KiloHertz (KHz).

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6. (Previously presented): A fast frequency and time acquisition system for synchronizing digital information for use with a digital radio frequency (RF) receiver comprising:

- a first channel select (CS) filter for filtering digital baseband information;
 - a frame synchronization detector for detecting a single synchronization word in the digital baseband information from the first CS filter;
 - a coarse symbol time estimator for coarsely determining the symbol time of the digital signal using the single time synchronization word after ~~from~~ the frame synchronization detection detector;
 - a ~~one-step~~ fine frequency estimator for finely determining the frequency error of the signal using the single time synchronization word after ~~from~~ the coarse symbol time estimator ~~estimation~~ for providing frequency adjustment;
 - a mixer for combining the unfiltered digital information with the frequency error estimate to provide a mixed frequency corrected digital signal;
 - a second CS filter for filtering the mixed digital signal;
 - a fine symbol time estimator for finely determining the symbol time of the signal from the second CS filter using the single time synchronization word; and
 - a symbol detector for decoding the digital signal from the fine symbol time estimation estimator and;
- wherein the system operates without the use of an automatic frequency control.

7. (canceled)

8. (Original): A digital receiver fast frequency and time acquisition system as in claim 6, wherein the first CS filter has a wider bandwidth than the second CS filter.

9. (Original): A digital receiver fast frequency and time acquisition system as in claim 6, wherein the second CS filter has exactly half (or any other simple fractions such as one third, or one fourth etc) the bandwidth of the first CS filter.

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10. (Original): A digital receiver fast frequency and time acquisition system as in claim 6, wherein the first CS filter has a 3 decibel (dB) bandwidth of approximately 6 Kilohertz (KHz).

11. (Original): A digital receiver fast frequency and time acquisition system as in claim 10, wherein the second CS filter has a 3 decibel (dB) bandwidth of approximately 3 Kilohertz (KHz).

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12. (currently amended): A method for rapidly acquiring time and frequency synchronization for a digital RF baseband signal comprising the steps of:

- directing a digital baseband signal to a first channel select (CS) filter;
- detecting a single time synchronization word in the digital signal from the first CS filter;
- determining a coarse symbol time estimate of the signal from the first CS filter using the single time synchronization word;
- determining a ~~one-step~~ fine frequency error estimate of the digital signal using the single time synchronization word after ~~from~~ the coarse symbol time estimation estimator;
- applying a frequency correction to the digital signal to provide a frequency corrected signal via a mixer;
- applying the frequency corrected signal to a second CS filter;
- determining a fine symbol time estimate of the signal from the second CS filter using the single time synchronization word;
- applying a fine time correction to the signal from the second IF filter; and
- detecting the symbols from the fine time corrected signal; and
- wherein the steps of directing a digital baseband signal through detecting the symbols are performed without using an automatic frequency control.

13. (Original): A digital receiver fast frequency and time acquisition system as in claim 12, wherein the first CS filter has a wider bandwidth than then second CS filter.

14. (Original): A digital receiver fast frequency and time acquisition system as in claim 12, wherein the second CS filter has exactly half the bandwidth of the first CS filter.

15. (Original): A digital receiver fast frequency and time acquisition system as in claim 12, wherein the first CS filter has a 3 decibel (dB) bandwidth of approximately 6 Kilohertz (KHz).

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16. (Original): A digital receiver fast frequency and time acquisition system as in claim 15, wherein the second CS filter has a 3 decibel (dB) bandwidth of approximately 3 Kilohertz (KHz).